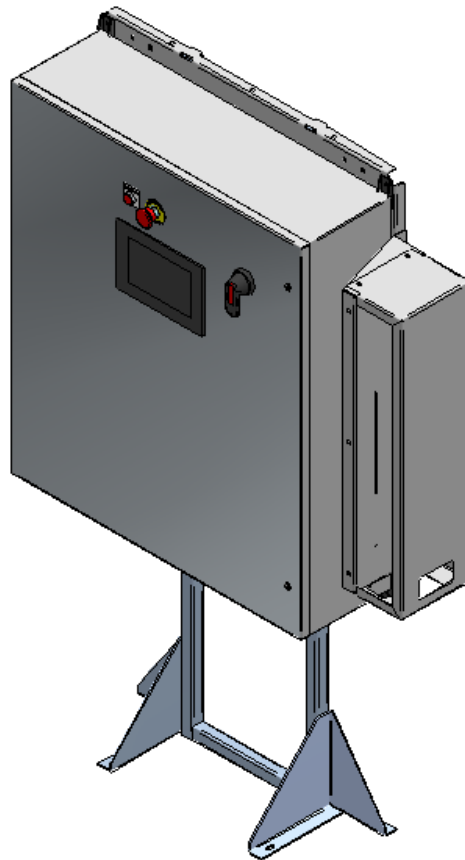# SIMPLE BIN SITE WITH U-TREAT LITE

Operators Manual

Document: TD-09-06-1068   **Revision: A**

INTRODUCTION

Thank you for choosing USC, LLC for your equipment needs. We appreciate your business and will work diligently to ensure that you are satisfied with your choice.

OVERVIEW

The purpose of this manual is to provide you with the basic information needed to operate and maintain the Simple Bin Site . It does not hold USC, LLC liable for any accidents or injuries that may occur.

RECEIVING YOUR EQUIPMENT

As soon as the equipment is received, it should be carefully inspected to make certain that it has sustained no damage during shipment and that all items listed on the packing list are accounted for. If there is any damage or shortages, the purchaser must immediately notify USC, LLC. Ownership passes to purchaser when the unit leaves the USC, LLC. premises. The purchaser is responsible for unloading and mounting all components of the equipment.

Document the serial number of the machine for future reference. The serial number is located on the in the upper right hand corner of the control panel.

Serial Number

SERIAL NUMBER:_____

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SECTION A — SAFETY INSTRUCTIONS

Every year accidents in the work place maim, kill and injure people. Although it may be impossible to prevent all accidents, with the right combination of training, operating practices, safety devices and operator vigilance, the number of accidents can be significantly reduced. The purpose of this section is to educate equipment users about hazards, unsafe practices and recommended hazard avoidance techniques.

SAFETY WORDS AND SYMBOLS

It is very important that operators and maintenance personnel understand the words and symbols that are used to communicate safety information. Safety words, their meaning and format, have been standardized for U.S. manufacturers and published by the American National Standards Institute (ANSI). The European Community (E.C.) has adopted a different format based on the International Standards Organization (I.S.O.) and applicable machinery directives. Both formats are presented below. Graphic symbols are not standardized but most manufacturers will use some variation of the ones seen in this manual.

⚠ **DANGER**	Indicates an imminently hazardous situation which, if not avoided, **will** result in death or serious injury.
⚠ **CAUTION**	Indicates a potentially hazardous situation which, if not avoided, **could** result in death or serious injury.
⚠ **WARNING**	Indicates a potentially hazardous situation which, if not avoided, **may** result in minor or moderate injury and/or property damage.
SAFETY INSTRUCTIONS	Provides additional information that the operator needs to be aware of to avoid a potentially hazardous situation.

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Mandatory Lockout Power Symbol. Disconnect, lockout and ta-gout electrical and other energy sources before inspecting, clean-ing or performing maintenance on this panel.

International Safety Alert Symbol. The exclamation point (!) sur-rounded by a yellow triangle indicates that an injury hazard ex-ists. However, it does not indicate the seriousness of potential in-jury. The exclamation point (!) is also used with the DANGER, WARNING and CAUTION symbols so the potential injury is indicated.

Electrocution Hazard Symbol. This symbol indicates that an electrocution hazard exists. Serious injury or death could result from contacting high voltage.

International Electrocution Hazard. This symbol indicates that an electrocution hazard exists. Serious injury or death could result from contacting high voltage.

Mandatory Read Manual Action Symbol. (I.S.O. format) This symbol instructs personnel to read the Operators Manual before servicing or operating the equipment.

Mandatory Read Manual Action Symbol. This symbol instructs personnel to read the Operators Manual before servicing or oper-ating the equipment.

NOTICE Notice is used to notify people of important installation, operation or maintenance information which is not hazard related.

LOCKOUT / TAGOUT PROCEDURES

Lockout/Tagout is the placement of a lock/tag on an energy isolating device in accordance with an established procedure. When taking equipment out of service to perform maintenance or repair work, always follow the lockout/tagout procedures as outlined in ANSI Z344.1 and/or OSHA Standard 1910.147. This standard "requires employers to establish a program and utilize procedures for affixing appropriate lockout devices or tagout devices to energy isolating devices and to otherwise disable machines or equipment to prevent unexpected energizing, start-up, or release of stored energy in order to prevent injury to employees."

EMERGENCY STOP

There is an Emergency Stop push button on the Simple Bin Site control panel. Actuators of emergency stop shall be colored RED.
The background immediately around the device actuator shall be colored YELLOW. The actuator pushbutton operated device shall be of the palm or mushroom head type.

CONTROLLED STOP

This is the stopping of machine motion by reducing the electrical command signal to 0 (zero) once the stop signal has been recognized. The operator initiates this stop by pressing the PAUSE button at he bottom of the main screen.

HAZARD REVIEW

Electrocution Hazard

Electrocution accidents are most likely to occur during maintenance of the electrical system or when working on or near exposed high voltage wiring. This hazard does not exist when the electrical power has been disconnected, properly locked, and tagged out.

Automatic Start Hazard

This equipment may be controlled by an automated system and may start without warning. Failure to properly disconnect, lockout, and tagout all energy sources of remotely controlled equipment creates a very hazardous situation and could cause injury or even death. PLEASE STAY CLEAR AND BE ALERT.

YOU are responsible for the **SAFE** operation and maintenance of your USC, LLC equipment . **YOU** must ensure that you and anyone else who is going to operate, maintain or work around the equipment be familiar with the operating and maintenance procedures and related **SAFETY** information contained in this manual. This manual will take you step-by-step through your working day and alert you to good safety practices that should be adhered to while operating the equipment

Remember, **YOU** are the key to safety. Good safety practices not only protect you, but also the people around you. Make these practices a working part of your safety program. Be certain that **EVERYONE** operating this equipment is familiar with the recommended operating and maintenance procedures and follows all the safety precautions. Most accidents can be prevented. Do not risk injury or death by ignoring good safety practices.

- Equipment owners must give operating instructions to operators or employees before allowing them to operate the machine, and at least annually thereafter per OSHA (Occupational Safety and Health Administration) regulation 1928.57.

- The most important safety device on this equipment is a **SAFE** operator. It is the operator's responsibility to read and understand **ALL** Safety and Operating instructions in the manual and to follow them. All accidents can be avoided.

- A person who has not read and understood all operating and safety instructions is not qualified to operate the machine. An untrained operator exposes himself and bystanders to possible serious injury or death.

- Do not modify the equipment in any way. Unauthorized modification may impair the function and/or safety and could affect the life of the equipment.

- Think SAFETY! Work SAFELY!

GENERAL SAFETY

1. Read and understand the operator's manual and all safety labels before operating, maintaining, adjusting or unplugging the equipment .

2. Only trained persons shall operate the equipment . An untrained operator is not qualified to operate the machine.

3. Have a first-aid kit available for use should the need arise, and know how to use it.
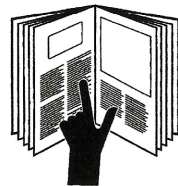
4. Provide a fire extinguisher for use in case of an accident. Store in a highly visible place.

5. Do not allow children, spectators or bystanders within hazard area of machine.

6. Wear appropriate protective gear. This includes but is not limited to:

   - A hard hat
   - Protective shoes with slip resistant soles
   - Protective goggles
   - Heavy gloves
   - Hearing protection
   - Respirator or filter mask

7. Place all controls in neutral or off, stop motor, and wait for all moving parts to stop. Then disable power source before servicing, adjusting, repairing, or unplugging.

8. Review safety related items annually with all personnel who will be operating or maintaining the equipment.
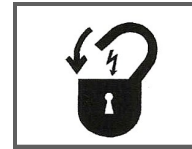
OPERATING SAFETY:

1. Read and understand the operator's manual and all safety labels before using.

2. Disconnect and disable electrical supply completely and wait for all moving parts to stop before servicing, adjusting, repairing or unplugging.

3. Clear the area of bystanders, especially children, before starting.

4. Be familiar with the machine hazard area. If anyone enters hazard area, shut down machine immediately. Clear the area before restarting.

5. Keep hands, feet, hair and clothing away from all moving and/or rotating parts.

6. Stay away from overhead obstructions and power lines during operation and transporting. Electrocution can occur without direct contact.

7. Do not operate machine when any guards are removed.

8. Inspect welds and repair if needed.

PLACEMENT SAFETY

1. Move only with the appropriate equipment

2. Stay away from overhead power lines when moving equipment. Electrocution can occur without direct contact.

3. Be familiar with machine hazard area. If anyone enters hazard areas, shut down machine immediately. Clear the area before restarting.

4. Operate the equipment on level ground free of debris. Anchor the equipment to prevent tipping or upending.

⚠ WARNING   Before placement of the equipment , be sure that ground is reasonably level. The equipment may topple or work improperly if the ground is too uneven, damaging the equipment and/or causing personal injury.

MAINTENANCE SAFETY

1. Review the operator's manual and all safety items before working with, maintaining or operating the equipment .

2. Place all controls in neutral or off, stop motors, disable power source, and wait for all moving parts to stop before servicing, adjusting, repairing or unplugging.

3. Follow good shop practices:

   Keep service area clean and dry.
   Be sure electrical outlets and tools are properly grounded.
   Use adequate light for the job at hand.

4. Keep hands, feet, hair and clothing away from all moving and/or rotating parts.

5. Clear the area of bystanders, especially children, when carrying out any maintenance and repairs or making any adjustments.

6. Before resuming work, install and secure all guards when maintenance work is completed.

7. Keep safety labels clean. Replace any sign that is damaged or not clearly visible.

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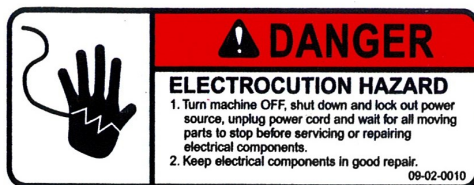Seed Treating Solutions®

SAFETY LABELS

1. Keep safety labels clean and legible at all times.

2. Replace safety labels that are missing or have become illegible.

3. Replaced parts that displayed a safety label should also display the current label.

4. Replacement safety labels are available. Contact your authorized dealer.

How to Install Safety Labels:

- Be sure that the installation area is clean and dry.

- Be sure temperature is above 50°F (10°C).

- Decide on the exact position before you remove the backing paper.

- Remove the smallest portion of the split backing paper.

- Align the sign over the specified area and carefully press the small portion with the exposed sticky backing in place.

- Slowly peel back the remaining paper and carefully smooth the remaining portion of the sign in place.

- Small air pockets can be pierced with a pin and smoothed out using the piece of sign backing paper.

⚠ **WARNING** Located on the USC equipment you will find safety labels. Always be sure to read and follow all directions on the labels.

⚠ **DANGER**
ELECTROCUTION HAZARD
1. Turn machine OFF, shut down and lock out power source, unplug power cord and wait for all moving parts to stop before servicing or repairing electrical components.
2. Keep electrical components in good repair.
09-02-0010

Part # 09-02-0010

DANGER
KEEP HANDS CLEAR
WHEN EQUIPMENT IS RUNNING
PELIGRO
NO ACERQUE LAS MANOS
CUANDO EL EQUIPO ESTE FUNCIONANDO
09-02-0001

Part # 09-02-0001

CAUTION
DO NOT OPERATE THIS MACHINE
WITHOUT GUARDS IN PLACE
CUIDADO
NO SE PERMITE OPERAR ESTA MAQUINA SIN GUARDAS EN POSICION
09-02-0002

Part # 09-02-0002

⚠ **WARNING** Guards provided with USC equipment are to remain in place during operation.

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INSTALLATION SECTION B

⚠ DANGER **HIGH VOLTAGE ~** Always disconnect the power source before working on or near the control panel or lead wires.

⚠ DANGER **HIGH VOLTAGE ~** Use insulated tools when making adjustments while the controls are under power.

NOTICE Permanent installation may require additional electrical cords, chemical tubing, and air lines, since each installation is unique.

SET-UP

The following steps outline the initial set-up of your USC Simple Bin Site :

1. Clear the area of bystanders, especially small children, before moving.

2. Inspect Simple Bin Site control panel thoroughly for screws, bolts, fittings, etc. which may have come loose during shipping.

3. The Simple Bin Site control panel should be placed on level ground.

4. Setup the Simple Bin Site control panel at a place that is convenient to the operator. After locating the panel, anchor the panel stand to the floor using the four concrete anchor bolts provided.

NOTICE USC requires that all touch screen control panels be set up inside a building or in a covered structure to protect the machine from weathering.

CONTROL PANEL CONNECTIONS

SAMPLE LABEL

Mfg. By: USC, LLC
Max Voltage: 230V 1PH 60 HZ
 Total FLA: 84
Largest Motor FLA: 50
Schematic number: CSBS1205N40N10
Enclosure rating: UL type 1
Short Circuit Current Rating:
 5ka RMS Sym, 600V Max

WARNING
To maintain over current, short-circuit and ground fault protection, the manufacturer's instruction for selection of overload and short circuit protection must be followed to reduce the risk of fire or electrical shock.

WARNING
If an overload or a fault current interruption occurs, circuits must be checked to determine the cause of the interruption. If a fault condition exists, the current-carrying components should be examined and replaced if damaged, and the integral current sensors must be replaced to reduce the risk of fire or electrical shock.

Panel 1 of 1
See schematic number: CSBS1205N40N10
for interconnections.

Replacement Fuse Chart

Fuse	Line	Size	Type
FU8056	8405	2A	T SB/TD GMD-2-R
FU8051	8427	2A	T SB/TD GMD-2-R

!! WARNING !!
230Volts/ 1Phase/60 Hertz supply only.
L1 to Neutral voltage must not exceed 120 Volts!!

1. Have a certified electrician provide power to the Simple Bin Site system and wire in all necessary customer supplied wiring, including Modbus-TCP cables as listed in your provided Simple Bin Site schematics. Provide convenient shutdown switches and comply with local electrical codes. USC recommends that flexible conduit be used wherever possible.

Incoming power connected to these terminals in the Bin Site Control Panel

CONTROL PANEL CONNECTIONS

2	2	2	2	3

PJ4810 PJ4811 PJ4812 PJ4813 PJ4803

MODBUS-TCP MODBUS-TCP MODBUS-TCP MODBUS-TCP USB
MODBUS-TCP MODBUS-TCP MODBUS-TCP MODBUS-TCP USB

PJ5002 PJ5006 ENCODER ENCODER PJ5102
E-STOP A E-STOP B POWERLINK

PJ5008 PJ5012
AIR PRESSURE SOLENOID
RELIEF VALVE POWER

4	4	5	5	6	7	8

CONTROL PANEL BOTTOM   CONTROL PANEL SIDE
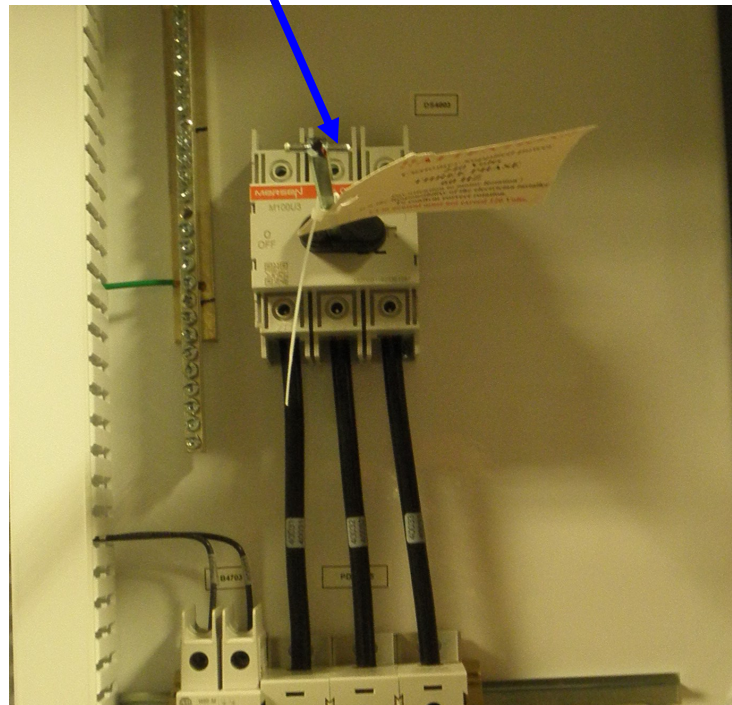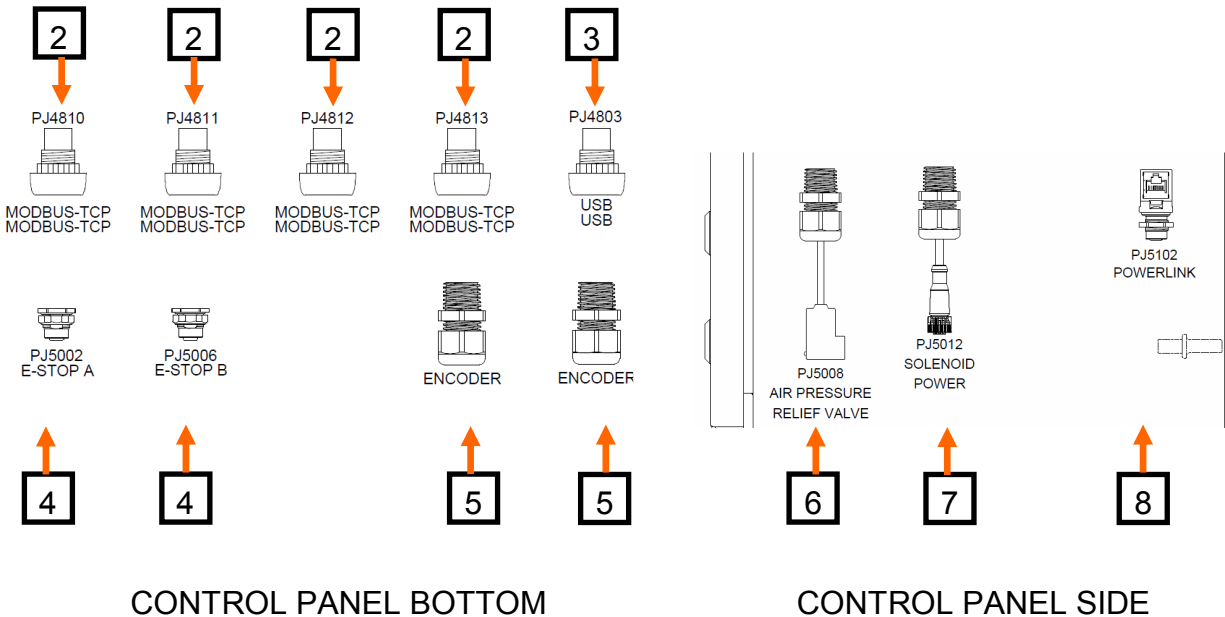
2. Modbus-TCP connects to scale head on batch hopper, printer, wireless access point, and LPX lite scale indicator.

3. USB Port used for exporting reports.

4. If using this product with a USC treater, connect the red cable to the PJ-ESTOP-A on the treater control panel and then to the PJ-ESTOP-B on the Simple Bin Site control panel. This cable must run from an A connection to a B connection (never A to A or B to B). If you are not using this product with a USC treater, connect the two red plugs provided into the PJ-ESTOP-A and PJ-ESTOP-B connections.

5. These are cord grips. The encoder wiring must be connected to terminal blocks inside the panel by a licensed electrician.

6. Air pressure relief valve connected to air line to release the pressure in the system when the E-Stop is activated. Pre-wired at the plant.

7. Factory connected to the solenoids on the side of the panel.

8. Power link connected to the solenoid valve communications port. Pre-wired at the plant.

9. All conveyors must be connected by a licensed electrician inside the panel.

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CONTROL PANEL CONNECTIONS

10. Supply approximately 100-110 psi of air pressure. The line goes to the regulator / filter group on the top / right side of the Bin Site Control Panel. (below)

11. Contact your authorized dealer to setup a startup and training session(s) before using your Simple Bin Site System .

12. Have the scales calibrated by a state certified professional scale technician .

Connect Air Line Here

MECHANICAL OPERATION

SIMPLE BIN SITE CONTROL PANELOVERVIEW

**Emergency
Stop
Reset**

**Emergency
Stop**

**ON /OFF
Switch**

**HMI
Display**

**Solenoid
Cover**

**Pneumatic
Solenoids**

**Control
Panel**

**Control
Panel
Stand**
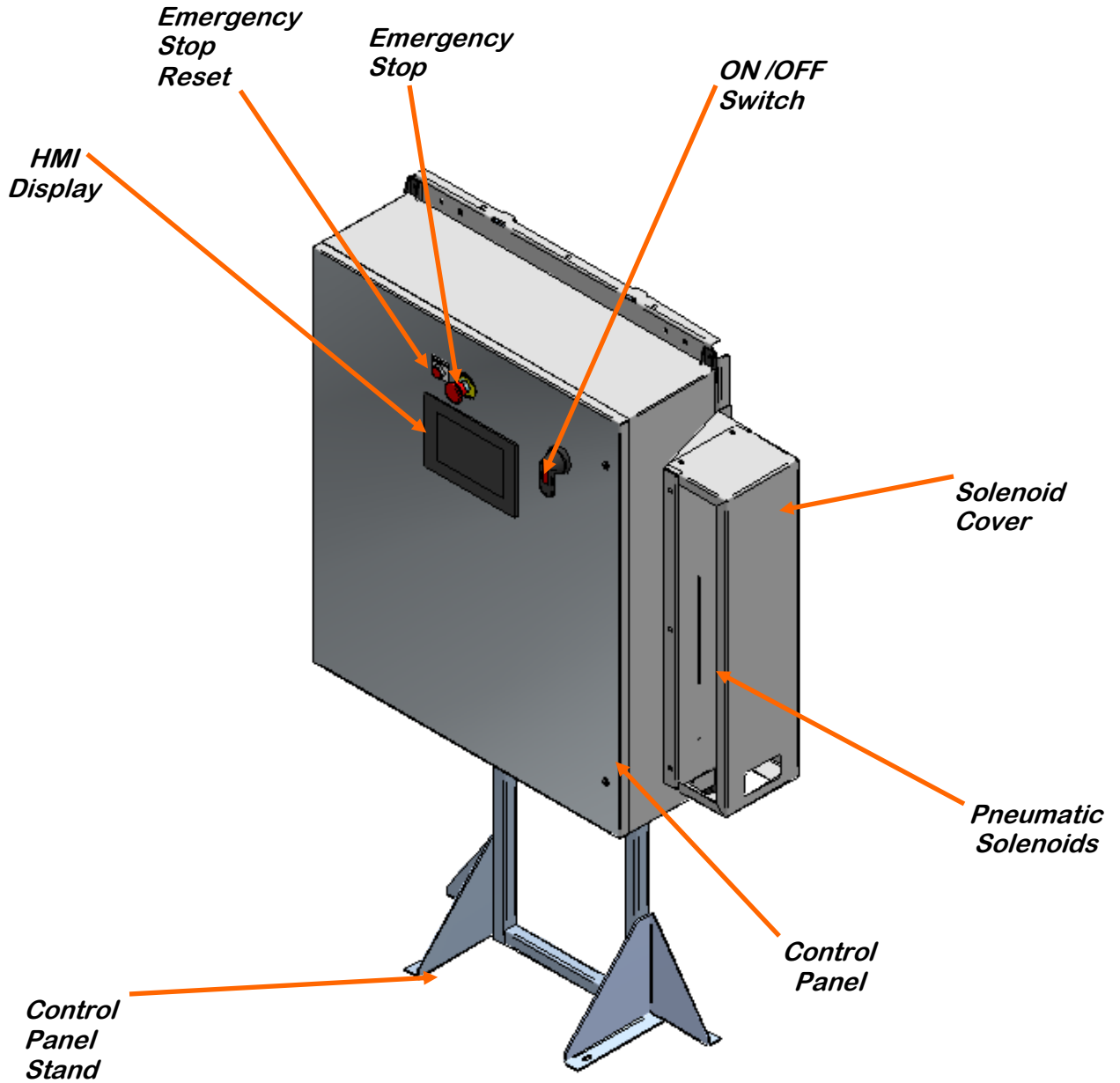
BIN SLIDE GATES

An air-actuated slide gate attaches to the bottom of each bin. The slide gate sits below the manual crank gate on the bin. The flow rate of seed passing through the gate is adjusted by moving the collar on the rod that exits out of the back of the bin slide gate. Moving the collar further away from the bin slide gate will allow the gate to open more and increase seed flow. It is recommended that the manual gate be opened all the way. The system calibrates seed flow through a timing mechanism that tells the air gate to close after a given amount of time. During each run of seed, the system will constantly perform an automatic calibration that is flow rate specific

PRO BOX HOPPER (optional)

The pro box hopper is an inverted pyramid shaped hopper that is used as a means of running seed straight from a pro box into the weigh hopper system. This hopper includes an adjustable slide gate for metering the flow of seed and adjustable legs for changing the height of the hopper.

UNDERBIN CONVEYOR

The underbin conveyor sits directly below each of the air-actuated slide gates that are in turn positioned directly under the manual slide gates of the bulk bins. The conveyor transports seed forward to the scale fill conveyor. The underbin conveyor may also include an option so that it can run in reverse for clean out purposes. Seed is moved inside the underbin conveyor via a crescent belt. An adjustment for the tracking of this belt is located at both the head and tail section of the conveyor. The head section also includes a viewing window and the tail section has a removable cover to help with proper alignment of the underbin conveyor belt. An encoder is located in the tail section of the underbin conveyor. The encoder is used to verify that the conveyor is running without any slippage at the belt.

UNDERBIN CONVEYOR ENCODER (OPTIONAL)

The underbin conveyor encoder is an electronic device that is connected to a non-drive shaft on the underbin conveyor. This is usually the rear conveyor shaft.   The encoder sends an electrical signal to the weigh hopper system whenever the shaft is spinning. That signal allows the weigh hopper system to know that the belt on the underbin conveyor is traveling at the correct speed and that no slippage is occurring. This process allows the weigh hopper system to perform correct auto-calibrations during each run of seed.

SCALE FILL CONVEYOR

The scale fill conveyor is a fixed conveyor that is used to transport seed from the discharge end of the underbin conveyor to the top of the weigh hopper. This conveyor's intake hopper will sit directly under the discharge portion of the underbin conveyor and the discharge end of the scale fill conveyor will be directly above the center of the weigh hopper. The scale fill conveyor is commonly used as the device that brings seed from outside of the treater building to the inside.

WEIGH HOPPER, SLIDE GATE & SCALE HEAD

Once seed exits the discharge end of the scale fill conveyor, it will fall down into a fixed seed ladder that is located in the center of the weigh hopper (There is no seed ladder on the 100 unit hopper). Seed will then come to rest above the slide gate as it waits to be weighed. The weigh hopper sits atop a scale assembly. The system uses a Avery Weigh-Tronix ZM301 scale head to display the current weight of the seed in the weigh hopper. The scale head communicates with the system via an MODBUS-TCP cable. When the system finishes shutting down each of the conveyors, it will then look to the scale head to get the current weight of the seed in the weigh hopper for calibration purposes.

NOTICE   The Avery Weigh-Tronix ZM301 scale head will require calibration by a state certified calibration specialist in order for it to be legal for trade.

Located below the weigh hopper is an air-actuated slide gate. This slide gate has two magnetic sensors that are positioned to read whether or not the slide gate is currently in the open or closed position. This is done to ensure an accurate scale reading will always be achieved. On floor mounted hoppers, directly below the air actuated slide gate is a manual gate that can be positioned to control the flow of seed from the weigh hopper into a conveyor.

SECTION D — ELECTRICAL OPERATION

⚠ DANGER   *HIGH VOLTAGE ~* Always disconnect the power source before working on or near the control panel or lead wires.

⚠ DANGER   *HIGH VOLTAGE ~* Use insulated tools when making adjustments while the controls are under power.

⚠ CAUTION   AUTHORIZED PERSONNEL only shall work on the control panel. Never allow anyone who has not read and familiarized themselves with the owner's manual to open or work on the control panel.

This section provides a general overview and description of the operator controls for the Simple Bin Site.

NOTICE   **USC recommends the use of a surge protection device with a minimum rating of 400 Joules for all automated main control panels.**

General Panel Descriptions

- The Simple Bin Site Panel is a 42 x36 x10 inch enclosure that contains all of the electrical control components as well as the HMI (Human/Machine Interface) touch screen. The air solenoid bank that controls all of the bin site system's air valves is located on the side of the panel. The operator is able to control the entire system through the HMI. The panel is connected to the scale head via a modbus cable.

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Control Panel Touch Screen

This section explains the function of the touch screen controls program.

USC STARTUP SCREEN

This is the first screen the operator will see after the system is powered on.

If this is the first time the system has been powered on, a popup will occur with a User Acknowledgement statement. Please read the contents and then press the Acknowledge button. That should be the only time you see it.

Aside from the Acknowledgement popup, the screen will display a progress bar while the system is still starting up. Once the progress bar reaches the end, it will disappear and instruct you to press anywhere to be advanced to the Main screen.
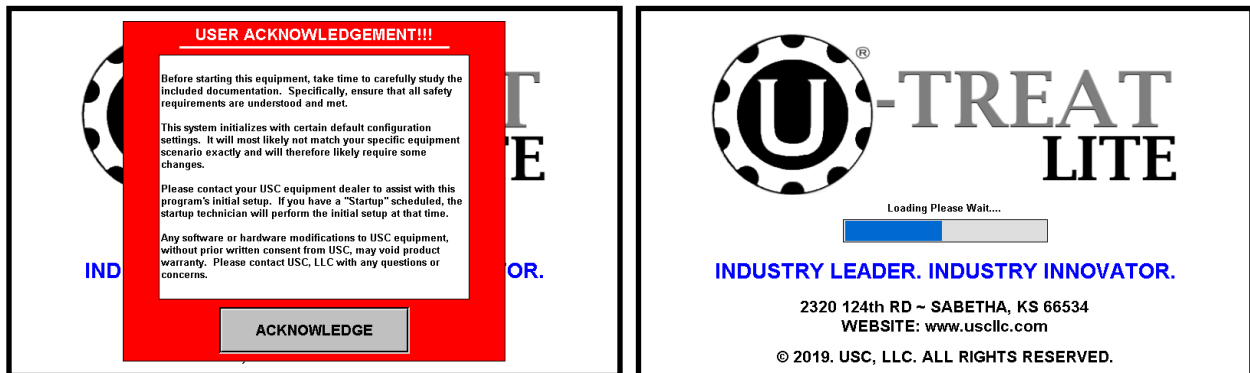
FUNCTIONS COMMON TO ALL SCREENS

At the top of every screen is a blue title bar (see main screen image). In the center of the screen is the current screen title (A1). In the upper left corner is the date and time (A2). Pressing on it will take you to a screen where you can set the date and time. Below that is the weigh message bar (A3). It will display messages notifying the operator of which stage the weighing process is in. In the top right corner is the program version (A4) and current user identification (A5). Pressing on the current user area will take you to the login screen where you can change the currently logged in user.

At the bottom of every screen are the buttons for navigating from one screen to another (A6). Pressing the button in the lower right hand corner (A7) with USC U-Treat Lite logo on it returns the operator to the startup screen. Certain areas of the program will have additional sub-navigation buttons along the right-hand side of the screen. Further still (mostly in the data editing screens) some screens may then have buttons along the top for basically tabbing between sections or groups of options.

MAIN SCREEN

The main screen is your primary status and control area for automated runs of your equipment. It allows you to start a run, monitor its operation, pause the run if there is a problem and also shutdown a run early if needed.
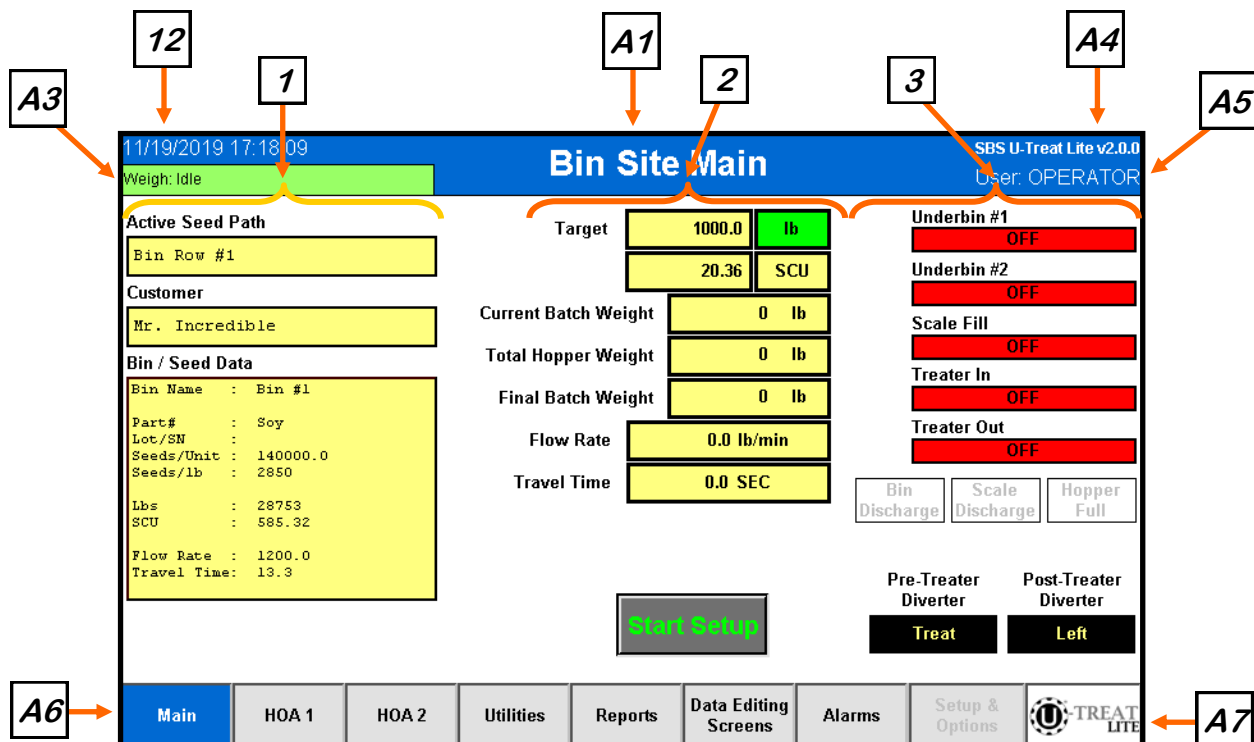
MAIN SCREEN

This screen is organized into 3 vertical sections, left to right and also generally with a top-down priority as well. Left to right you have 1. the data being fed into the automation process, 2. the status of the automation process itself and 3. the status of the equipment being affected by the automation process. Top-down is organized generally by most significant to least significant or by ascending order, depending on the objects being displayed. At the bottom of the screen is a Start Setup button which allows you to prepare and then begin an automated run. While a run is active, the Start Setup button will be gone and two buttons will be available in its place - Pause and at certain times Shutdown.

Further breakdown of the 3 sections...

Section 1 - Active Seed Path: This shows the Seed Path that is currently selected for use in an automated run. The Seed Path is a definition in the system that identifies all the conveyors, diverters and a given weigh device (in this case always a weigh hopper) that will be used to transport the seed all the way from the source location to the final destination. It even identifies the source-to-destination order in which all the devices exist so the system knows what conveyors to pause and when for various circumstances during an automated run.

Section 1 - Customer: This is the currently selected customer record that will be used in an automated run. It has no functional effect on the automated run but it will be stored in the job report at the end of an automated run.

Section 1 - Bin/Seed Data: This area shows several pieces of related information, all of which are the most relevant (and required) for automated runs, and what is displayed in this location is what an automated run will currently be using.

The first item displayed is which bin you're going to pull seed from. That bin has a particular kind of seed assigned/associated to it as a product part number. It also has inventory assigned to it in the form of an optional Lot/Serial# and also as a required on-hand quantity. Also associated with it is the SCU profile of the seed which is necessary if you perform your operations based on SCU measurements. Lastly, the bin also has performance statistics that are automatically stored and improved upon after each run. This constantly improves the accuracy in which seed can be withdrawn from a given bin.

MAIN SCREEN

<u>Section 2 - Target:</u> This shows the target amount of seed the operator intends to withdraw from the selected source bin. It is shown by both weight and by SCU's. This target amount is entered by the operator in the Startup Wizard (triggered by the Start Setup button). In the event of pulling from a manual hopper, this will always be 1,000,000 lbs.

<u>Section 2 - Current Batch Weight:</u> This is the amount of net weight accumulated so far for a given weighment batch.

<u>Section 2 - Total Hopper Weight:</u> This is the current amount of weight in the weigh hopper.

<u>Section 2 - Final Batch Weight:</u> This is the final, official amount of net weight tallied at the end of the filling and weighing stages.

<u>Section 2 - Flow Rate:</u> This is the flow rate coming out of the source bin. At first, it starts out with whatever the last stored flow rate is in the Bin/Seed Data record. Once seed is flowing into the weigh hopper and live data calculations kick in, this number will switch to showing live flow rate information. At the end of a run, if there were no pauses or alarms, this value will get stored into the Bin/Seed Data record for use next time.

<u>Section 2 - Travel Time:</u> This is the travel time for how long it takes for seed to travel from the source bin to the weigh hopper. At first, it starts out with whatever the last stored time is in the Bin/Seed Data record. Once seed is flowing into the weigh hopper and live calculations have begun, a new travel time is calculated and then shown on the screen. At the end of a run, if there were no pauses or alarms, this value will get stored into the Bin/Seed Data record for use next time.

MAIN SCREEN

<u>Section 3 - Top:</u> This area displays the status of up to 5 conveyors. How many are shown will vary from site to site depending on how many conveyors your site actually has.

<u>Section 3 - Middle Section:</u> This area has 3 indicators, each labeled for what they are for. They will be dimmed when inactive and will light up green when active. They are ordered left to right in the direction the seed travels.

Left to right, the first one is Bin Discharge. This indicates the status of the control gate on the bottom of the source bin. When active/lit, the bin gate is open and discharging seed.

The next indicator is Scale Discharge. This lights up when the weigh hopper's discharge gate is opened up to dump the weighed product. In cases where this gate does not exist or is under the control of another system, this indicator will still light and thus indicate when it is safe to discharge the product from the weigh hopper. It will remain lit until all the weight has been removed from the weigh hopper.

The last indicator is Hopper Full. When this sensor is used to pause an inlet conveyor somewhere in the seed path, this indicator will light in accordance with that sensor.

<u>Section 3 - Bottom Section:</u> This area shows the status of up to 2 diverters. They only show up here if each particular diverter is enabled in the system setup. You can have a pre-treater diverter to control whether the seed will travel through, or bypass, a treater, and you can have a post-treater diverter which allows you to pick up to 2 post-treater destinations. These diverters can either be controlled manually on one of the HOA screens, or they can be controlled directly by the Seed Path mechanism.

HOA 1 SCREEN

The HOA 1 screen is where you can manually control all of your conveyors and also the gate under the weigh hopper.

HOA stands for Hand, Off and Auto. To manually turn a conveyor on, for instance, put it in Hand mode. To turn it off, put it in Off mode. To hand it over to the automation control system, put it into Auto mode.

Next to the HOA buttons is also a status indicator light to tell you if the device is currently energized or not. In the case of the weigh hopper gate, it shows whether it is open or closed.

Further to the right, if a conveyor is reversible, there will be a Reverse button available. For the weigh hopper, the Open and Close commands become available when the device is put into Hand mode.

At the bottom right of the workspace is a quick button for setting all devices to Auto mode so they are ready for an automated run.

Along the right side you will see encoder indicators for conveyors depending on your configuration.
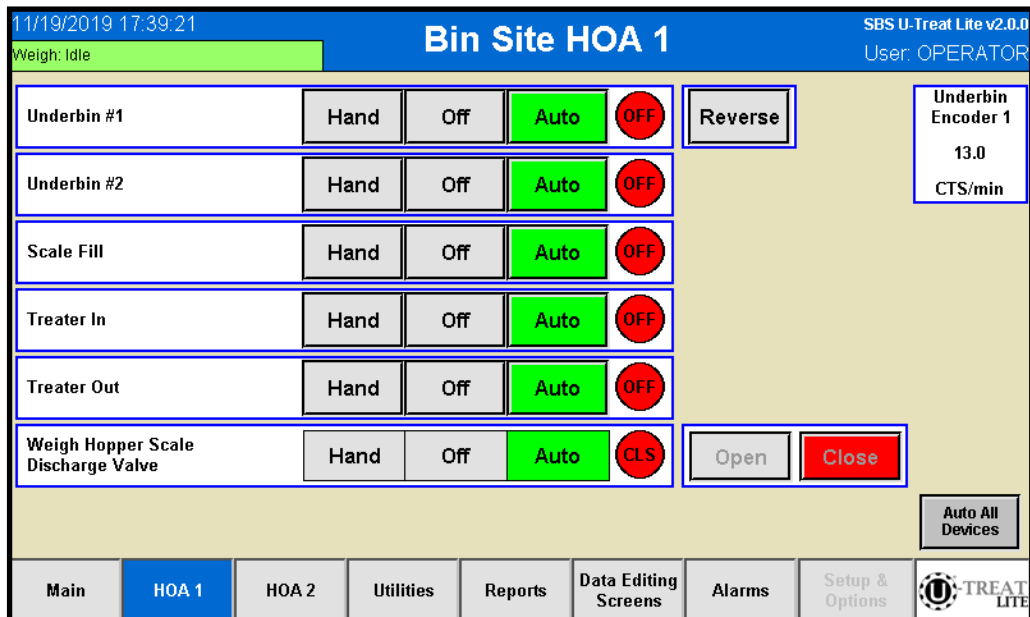
HOA 2 SCREEN

The HOA 2 screen is where you can manually control all of your bin gates and also the diverters.

Before you can operate the bins or the diverters, you must first put the Gate Control HOA into Hand mode. When you're done with manual operations, place it back into Off or Auto mode.
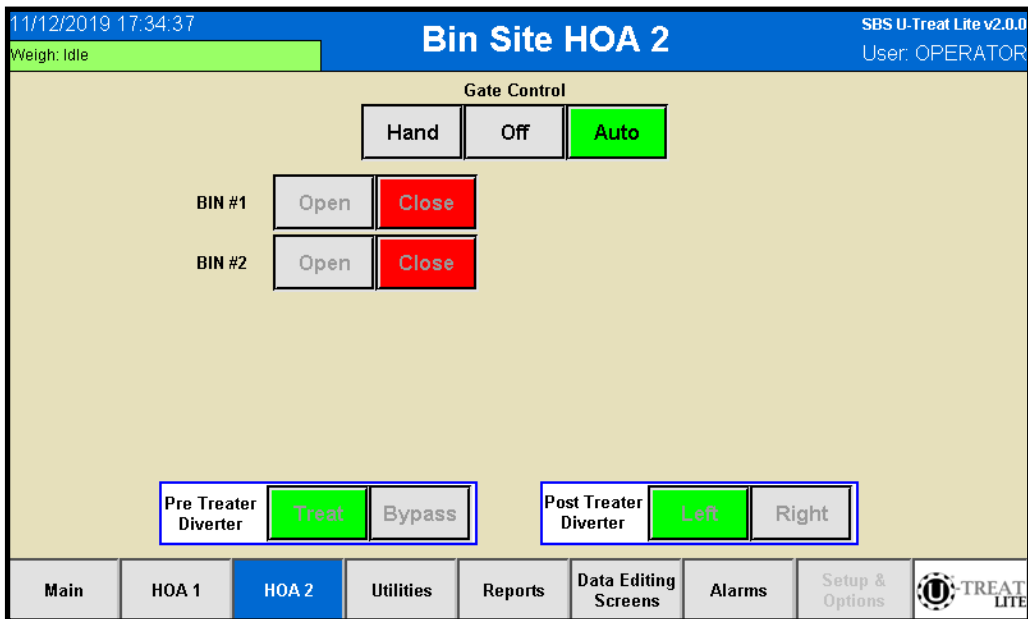
UTILITIES SCREEN

The Utilities screen is where you can change a few settings that affect the behavior of an automated run.

Weigh Hopper Maximum Weight: Tells the system the maximum amount of weight to allow into the weigh hopper. If this amount is exceeded, incoming seed flow will be stopped so as not to cause an overflow situation or overburden the scale.

Weigh Shutdown Time (seconds): Tells the system how long to wait after all the weight has been removed from the weigh hopper before beginning the shutdown process.

Inlet Conveyor Delay Restart Time (seconds): If you are feeding a treater inlet hopper that has a high level proximity sensor installed, the conveyor feeding the hopper will pause when the sensor detects seed. Once the seed level has fallen far enough that the sensor no longer detects seed, this number of seconds must pass before the conveyor will be restarted. This value may need to be altered depending on the size of the hopper and also the seed flow rate being delivered by the conveyor. Too low of a value will result in the conveyor turning on and off excessively. Too high of a value and your hopper might run empty and thus starve the treater.

11/19/2019 17:23:08	Utilities	SBS U-Treat Lite v2.0.0
Weigh: Idle		User: OPERATOR

5000	Weigh Hopper Maximum Weight	lb
7.0	Weigh Shutdown Time (seconds)	
4.0	Inlet Conveyor Delay Restart Time (seconds)	

| Main | HOA 1 | HOA 2 | Utilities | Reports | Data Editing Screens | Alarms | Setup & Options | U-TREAT LITE |

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REPORTS SCREEN

The Reports screen is where you can review all the data from your automated runs. Each automated run generates one record. Up to 5000 records can be stored in the system. This data can be exported, and also deleted, in the Import/Export screen. The Customer Name field can be edited after-the-fact if you wish. Each report record is automatically named by date/time, formatted most significant to least significant numerically, and indicated as a Weigh type of report for this particular U-Treat Lite project. The display list order is oldest to newest (ascending by date/time).

Item #1: This button expands the display list that allows you to select which report record you are currently viewing.

Item #2: This button collapses/closes the display list.
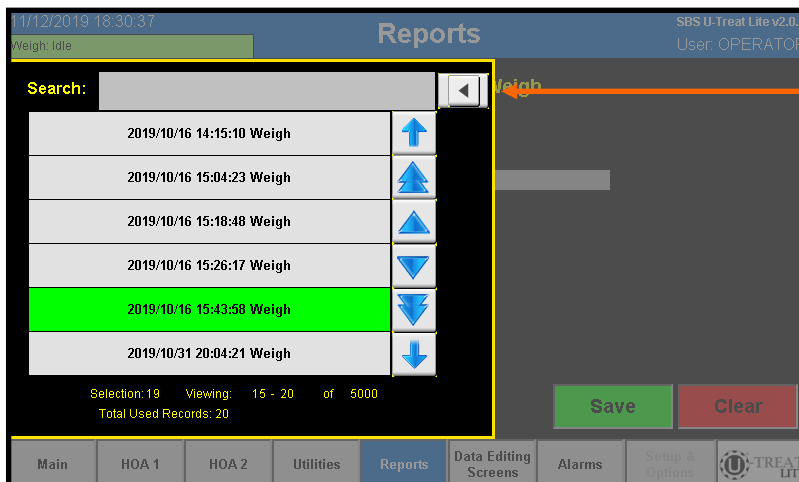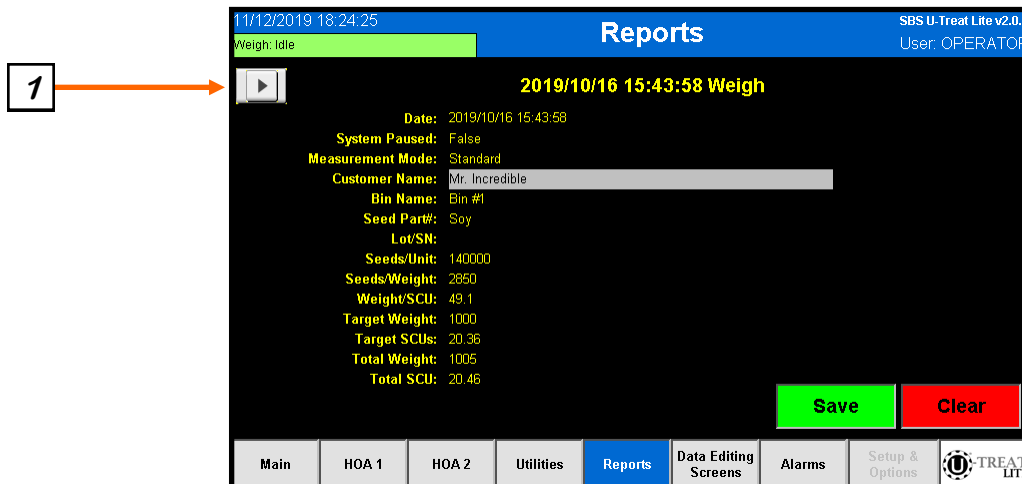
DATA EDITING SCREENS

The Data Editing Screens are where you can modify various database tables in order to configure the system for use.

Along the right side of the screen are navigation buttons for selecting which list of data you would like to view or edit. The one you are currently on will be blue and its name will be in the title bar at the top of the screen.

As was shown for the Reports screen, on the left side you will always see a button for expanding the display list for selecting a record to view or edit. You'll also see copy and paste buttons. These are for copying one record and pasting it into another (usually into an empty record entry).

Some of the database tables have more fields of data than can be shown at once on the screen. In those cases you will see some buttons along the top of the screen for essentially tabbing between certain groups of data within the record currently being edited.

At the bottom you'll see Save and Clear buttons. The Clear button will blank out the current record. Such an action still requires saving the record, however, to complete the deletion of a record. The Save button then obviously stores the current record into the database. The Save button will flash Red on and off if the record has been modified in any way and thus needs to be saved. If you decide to abort editing, simply select a different record from the display list on the left.

CUSTOMER EDITING SCREEN

The Customer Editing screen is where you can modify a list of customers that you might want to assign to an automated run so you know who that run was intended for. It currently stores a name, two address lines and a phone number.

BIN EDITING SCREEN

The Bin Editing screen allows you to edit all of the properties of each of your bins. This is broken out into 3 groups of data — Configuration, Product and Inventory.

First, we'll detail the Config area. This group of fields are configuration parameters for your bin.

Enable: Tells the system you physically have this particular bin present and connected to your system.

Flow Rate: This is the last recorded seed flow rate measured from this bin. This value automatically updates each time an automated run is performed.

Travel Time: This is the last recorded travel time for this bin for how long it takes for the seed to travel to the weigh device. This value automatically updates each time an automated run is performed.

Gate Time Adjust: This is a manual adjustment to help squeeze out the last few pounds of target weight accuracy.

Maximum Inventory: This is the maximum amount of inventory the bin can hold.

Gate Auto Calibrate: This enables a one-shot calibration routine. The next time an automated run is performed, it will tweak the Gate Time Adjustment value.

UoM: This is the Unit-of-Measurement used to display the inventory.

BIN EDITING SCREEN

Next, we'll detail the Product area. It defines what product is stored in the bin and its key properties.

Part #: This is the part number of the seed that is stored in your bin. This value needs to be unique for each bin. If you have the same part number in multiple bins, just add a "(2)" or "(3)" onto the end of the part number, as an example.

Lot/SN: This is the unique lot number or serial number of the product that is stored in your bin. This is an optional field and can be left blank if you wish.

Seeds/Unit: If you are going to use the SCU (Seed Count Units) measurement type during your automated runs, this field is required. It indicates how many seeds exist in one unit quantity of seed.

Seeds/Weight: If you are going to use the SCU (Seed Count Units) measurement type during your automated runs, this field is required. It indicates how many seeds exist in one pound or one kilogram of seed, depending on if your system is configured in U.S. Standard mode or Metric mode.

BIN EDITING SCREEN

Next, we'll detail the Inventory area. It is for working with the inventory quantity stored in the bin.

Current Inventory: This is the current inventory quantity stored in the bin. Each time an automated run occurs which uses this bin, at the end of the run the actual amount of weighed product processed by the run will be deducted from this bin's inventory quantity. You can also make adjustments to the inventory quantity on this screen. The UoM of this field is either pounds or SCU's. Keep in mind, regardless of whether you are using pounds or SCU's, under the hood the inventory quantity is actually stored only as pounds. The SCU approach is only a mathematical interpretation that translates weight to a seed count and ultimately seed surface area.
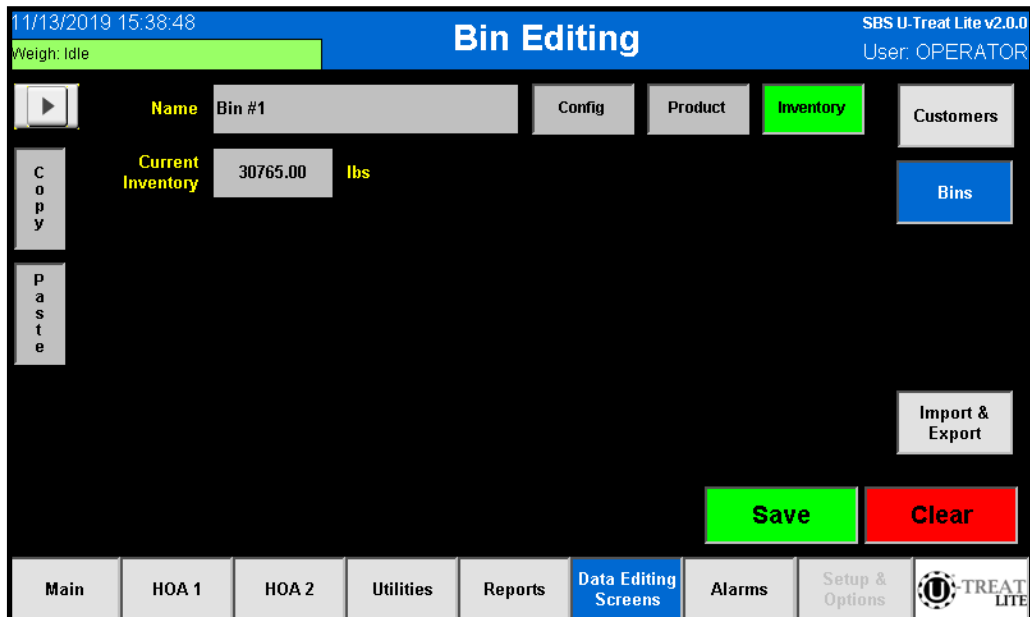
IMPORT & EXPORT SCREEN

The Import & Export screen is where you can import, export or delete any of the database tables in the system. Certain tables do not allow import, however, like Job Reports. In order to perform the import or export operations, a USB storage device is required and must be plugged into the controller. The USB storage device is not required to do deletion operations. The import/export formats are all CSV which is friendly with Excel and other various data systems.

There are a total of 16 tables in the system. You can scroll up and down through the list to find the data of interest. Not all tables are going to be important to everyone. The most important data for most people is probably going to be the Job Reports. Secondarily, you might want to save out important configuration data or your user-supplied data which drive the process. Here is a list of the import items to export in this case…

Job Reports	Bins
Inventory Master	Transport Paths
Inventory Details	Conveyors
Seed Profiles	
Customers	

During support cases, you might also be asked to export Alarms and/or Messages.
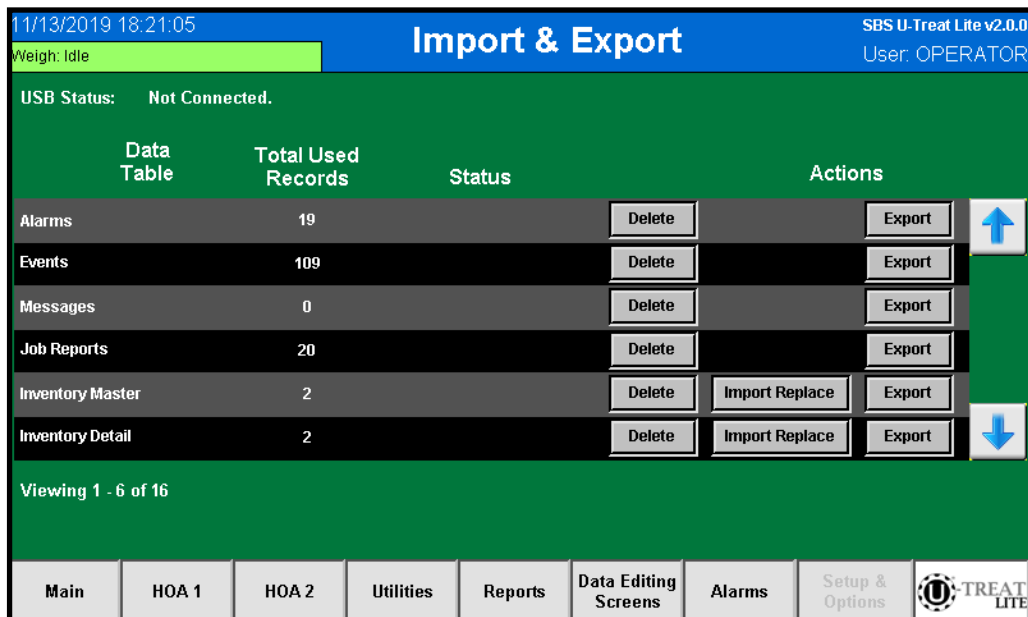
ALARMS SCREEN

The Alarms screen is where you can go to see any alarms that have been logged. It also has a Messages button for toggling over to viewing a separate list of logged messages.

Alarms are problems that have occurred that are of a serious nature. They will immediately pause an existing automated run and they will prevent a new run from being started until they are resolved.

Messages are warnings about various conditions to be concerned about but are not important enough to pause a run or keep a new one from being started.

By default you are looking at a filtered view which only shows records that haven't been archived yet. You can toggle the view by using the button at the top-right. You can view all the records, or just the unarchived ones.

In both the cases of Alarms or Messages, there are 3 stages of status to be concerned with. When first logged, one of these records will be in an "Active" stage. You can press the Reset button to change them to the next stage which is "Acknowledged". This action will also trigger numerous reset operations throughout the system to aid in recovering from whatever problems just occurred. Once you're finished with the problem(s) entirely, you can change your Acknowledged records to the final stage which his "Archived" by pressing the Clear Non-Active button. This will make them disappear from the list if you're in the filtered view (which is the default).

When not on the Alarms screen, if there is an active Alarm or Message, the Alarms button in the menu bar at the bottom will flash red for Alarms, yellow for Messages, or both.

SECURITY SCREEN

The Security screen is where you can go to change what user is currently logged in. To get to this screen, click/press the "User:" area in the top-right area of the screen.

The user that will be used the majority of the time is called OPERATOR. The password for this ID is USC.

Depending on who is currently logged in, various parts of the system will become available, hidden or locked out.

11/14/2019 10:33:24		**Security**		SBS U-Treat Lite v2.0.0
Weigh: Idle				User: OPERATOR

User Name

OPERATOR

Password

***

[Log In] [Log Out]

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AUTOMATED RUNS

From the Main screen, open the Start Wizard with the Start Setup button. You then need to make sure you have all the proper options selected before hitting the Start button.

Alternatively, you might have previously had to terminate a run for one reason or another and thus possibly still have seed in various areas of the system. In this event, you can perform a Clean Out run instead by clicking the Clean Out button and this will do a short automated run in order to clear out the entire system with the accounting as much in tact as possible.

Here's a break-down of the Startup Wizard...

Seed Path: This tells the system which set of conveyors, diverters, etc., need to be used and with what settings and in what order all the equipment occurs in to transport seed from the very beginning of the process to the final delivery point. Seed Paths are configured by your Dealer when the system is first installed into your facility.

Selected Bin: This is the source bin you are going to pull seed from. Your system may optionally also have a manual entry point for seed boxes, trucks, wagons, etc. In that event, instead of selecting a bin, you'll find an option for Manual Hopper.

Customer Name: This is the customer you would like to associate with this run.

Target Weight: This is the quantity of seed you would like to withdraw from the selected bin. If you are pulling from a Manual Hopper, this area will still show up and you can still edit it, but the values will be constantly forced to whatever your weigh hopper's maximum weight setting is. With a Manual Hopper, there is no control gate so the system simply waits for seed to arrive. When the flow has concluded, it will get weighed and then dumped.

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AUTOMATED RUNS

Once an automated run is started, you'll see the Start Setup button go away and a pause button will appear. In the top-left of the screen you can monitor the status of the Weigh automation. In the center of the screen you can monitor statistical data generated by the automation process. On the right you can monitor all of the equipment.

During startup, an optional scale ticket will be printed to show the starting weight.

Next, you'll see all conveyors kick on from the tail end of the seed path to the beginning of the seed path. Once the seed path has been running for generally 1.5 times the selected bin's travel time (ensures the entire seed path is clear), then the selected bin's discharge gate will be opened to deliver seed to the weigh hopper. (See orange markups on the image at the bottom of this page to see the conveyor startup/shutdown order and also the seed path relative to the hardware indicators on the screen).

Once it is determined that enough seed has been withdrawn from the selected bin, the bin's discharge gate will be closed.

Once the weigh hopper has determined that there is no further incoming seed flow, the upstream conveyors will be turned off, the hopper content will be weighed, optionally a scale ticket will be printed, and then the weigh hopper will be dumped/discharged.

The system will then wait indefinitely until the weigh hopper content is drained out.

SIMPLE BIN SITE

AUTOMATED RUNS

If you have a conveyor feeding an input hopper for a treater which has a high level proximity sensor installed (hopper-is-full sensor), as one possible example, and that hopper becomes full, you'll see the third indicator turn green under the conveyors area. The conveyor(s) feeding that hopper will then be paused for several seconds after this sensor turns off before turning back on (settable on the Utilities screen).

Once content is drained, the remaining conveyors will begin their shutdown process.

Once the system has completed all shutdown sequences, a job report is generated and then stored in the Reports area and bin inventory is also adjusted.

Below are screen shots showing the progression of an automated run. #1 shows all relevant conveyors are powered up and going through their clear-out timer. #2 shows the bin gate has opened and seed is being accumulated in the weigh hopper and the initially expected flow rate is 1200 lbs/min. #3 shows a live flow rate has been calculated. #4 shows the product has been weighed and is currently dumping/discharging.

OPTIONAL CONFIGURATIONS FOR AUTOMATED RUNS

No Weigh Hopper Discharge Gate Installed: If you do not have a weigh hopper discharge gate attached to your Simple Bin Site controller, then third party means are required to take the weighed product away. When it comes time to dump/discharge the weigh hopper in this scenario, the operator simply needs to wait for the Scale Discharge indicator to go green, which means the product has been weighed and it is now safe to drain the product out. In this scenario, your system might also be configured to present a popup at the beginning of your run just to remind you to make sure the weigh hopper discharge gate is closed. One example where this gate might not exist would be a system with a Loss-In-Weight treater is in the loop. Such a treater provides its own control gate that would be part of the weighing mechanism.

Conveyor Shutdown Timers: Another set of variables to be aware of is that each conveyor has its own custom shutdown timer. Depending on what other independent equipment might be between some of the conveyors that are controlled by the Simple Bin Site, these shutdown timers should be customized to make sure each conveyor, and any other equipment, gets fully emptied out at the end of the run. Any conveyor immediately after a treater, for instance, would need to have a delay time set that is more than enough time for the treater to finish cleaning itself out and the conveyor itself. These settings are usually done for you by the Dealer that got your site up and running, but you should be aware of them in case this behavior isn't quite fitting your needs.

Operator-Authorized Weigh Hopper Gate Control: Your system might have a feature enabled which requires requesting permission from the operator to discharge the weigh hopper. This comes in the form of a popup while the weigh hopper is filling. You don't have to authorize the dump immediately. You can, in fact, close the popup and go back to it later via a button that will stay available just overhead of the Shutdown button until you click it to re-open the authorization popup and eventually authorize the discharge. This accommodates setups where it would be unsafe to allow the Simple Bin Site to go straight to the dump/discharge stage without certain other preparations completed.

Manual Hopper Alternative Shutdown: By default, while performing a manual hopper run (not pulling from a bin), the system will wait indefinitely for incoming seed until the operator presses the Shutdown button. Your system can alternatively be configured to do this on its own based on no longer seeing movement of the weigh hopper.

SECTION E TROUBLESHOOTING

Below is a table describing the most frequent problems and solutions...

Problem	Possible Cause	Solution
Air gate (weigh hopper or bin) will not move. ...or… Diverter will not move.	1. Air supply is not present. 2. Air supply is not at high enough pressure.	1. Check air supply. 2. Check air pressure level.
An air gate with open/close sensors (usually weigh hopper gate) is not registering correctly on the control screen.	1. Gate's air cylinder may not be reaching entire stroke position. 2. Sensors on air cylinder might not be adjusted to correct position.	1. Sensors may need adjusted or repositioned on the air cylinder.
Conveyor overload keeps tripping	1. Seed flow is too high. 2. Too much liquid being applied.	1. Slow down seed flow. 2. Lower the liquid rate.
During an automated run, no seed gets delivered from the bin.	1. Air supply is not present. 2. Air supply is not at high enough pressure. 3. Bin has a manual gate above air control gate that's closed.	1. Check air supply. 2. Check air pressure level. 3. Check manual gate above air control gate.
Scale weight does not change on the screen.	1. Scale head is not registering weight. 2. Scale head is not communicating with the automation program.	1. Power-cycle scale head. 2. Use a test weight on weigh hopper and verify proper weight registration. 3. Check cable connection from weigh scale to scale head. 4. Check cable from scale head to automation control panel.
Conveyor Belt/Encoder Fault	1. Conveyor belt is slipping. 2. Conveyor Speed encoder is not working correctly.	1. Tighten and adjust the Conveyor belt as necessary. 2. Verify that sensor is tight to shaft and wiring is correct. If yes to both, then replace sensor.

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MAINTENANCE SECTION F

Proper maintenance of your Simple Bin Site system is critical for peak performance, reliability and accuracy of this system. The following is a guideline for the type of maintenance and servicing that should be performed on this unit. Your environment and uses may require additional maintenance and service beyond this list to assure a reliable and safe unit. The operator of this unit has ultimate responsibility to identify areas of concern and rectify them before they become a hazard or safety issue. There is no substitute for a trained, alert operator.

⚠ DANGER Do not put this unit into operation with any questionably maintained parts. Poor performance or a hazard may occur.

BIN SLIDE GATES

- Inspect all welds and structural components for bends, cracks and damage.
- Test slide gates for proper actuation with control panel.
- Remove air to gates and manually open and close gates. Check for any friction while gate is sliding.

WEIGH HOPPER, SLIDE GATE & SCALE HEAD

- Inspect all welds and structural components for bends, cracks and damage.
- Check for binding on scale components.
- Check wiring from scale to scale head for any damage or kinks.
- Test slide gate for proper actuation with control panel.
- Check slide gate sensors for correct positioning and signal.
- Have scale professionally re-calibrated as necessary.

CONTROL PANEL & AIR SYSTEM

- Drain water from compressor daily.
- Drain air dryer every 40 hours of operation.
- Test all air solenoids for correct actuation.
- Inspect all exterior wiring for any kinks or damage.

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ELECTRICAL PANEL

- Check and tighten wire connections.
- Check quick connects on bottom of control panel.
- Check to see if starters and/or overloads are tripped.
- Check to see if relays, timers and/or breakers are tripped.
- Check quick connects on end of Auxiliary cord.
- Check relay and fuse holder.
- Check power cords for cuts or frays and ensure ground is present.

STORAGE SECTION G

When storing the Simple Bin Site System for long periods of time, the following procedures must be followed to reduce the chance of rust, corrosion and fatigue of the Simple Bin Site System. You can also use these steps when storing the machine for the winter.

 A dust mask and protective rubber gloves shall be used when cleaning the machine.

WEIGH HOPPER & SLIDE GATE

1. Thoroughly clean the weigh hopper to remove all residue from the equipment.

2. Clean the slide gate of any seed or residue that may have built up.

FINAL

1. Store all portable components of the Simple Bin Site System inside a protective building to keep them from being exposed to the weather.

2. Disconnect power to the machine and all of the components.

3. Ensure all moisture has been removed from the airlines.

4. Disconnect the supply air line to the bottom of the solenoid bank and place a plug in the fitting to keep moisture out of the system.

USC Limited Warranty

USC, LLC, (Manufacturer) warrants its seed treating equipment as follows:

1. **Limited Warranty:** Manufacturer warrants that the Products sold hereunder will be free from defects in material and workmanship for a period of 18 months from date of shipment. If the Products do not conform to this Limited Warranty during the warranty period, Buyer shall notify Manufacturer in writing of the claimed defects and demonstrate to Manufacturer satisfaction that said defects are covered by this Limited Warranty. If the defects are properly reported to Manufacturer within the warranty period, and the defects are of such type and nature as to be covered by this warranty, Manufacturer shall, at its expense, furnish replacement Products or, at Manufacturer's option, replacement parts for the defective products. Shipping and installation of the replacement Products or replacement parts shall be at the Buyer's expense.

2. **Other Limits:** THE FOREGOING IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. Manufacturer does not warrant against damages or defects arising from improper installation (where installation is by persons other than Manufacturer), against defects in products or components not manufactured by Manufacturer, or against damages resulting from such non-Manufacturer made products or components. Manufacturer passes on to the Buyer the warranty it received (if any) from the maker of such non-Manufacturer made products or components. This warranty also does not apply to Products upon which repairs and / or modifications have been effected or attempted by persons other than pursuant to written authorization by Manufacturer. This includes any welding on equipment which could damage electrical components. Manufacturer does not warrant against casualties or damages resulting from misuse and / or abuse of Products, improper storage or handling, acts of nature, effects of weather, including effects of weather due to outside storage, accidents, or damages incurred during transportation by common carrier.

3. **Exclusive Obligation:** THIS WARRANTY IS EXCLUSIVE. The sole and exclusive obligation of Manufacturer shall be to repair or replace the defective Products in the manner and for the period provided above. Manufacturer shall not have any other obligation with respect to the Products or any part thereof, whether based on contract, tort, strict liability or otherwise. Under no circumstances, whether based on this Limited Warranty or otherwise, shall Manufacturer be liable for lost profits, lost revenue, lost sales (whether direct or indirect damages), incidental, special, punitive, indirect or consequential damages.

4. **Other Statements:** Manufacturer's employees or representatives' oral or other written statements do not constitute warranties, shall not be relied upon by Buyer, and are not a part of the contract for sale or this limited warranty.

5. **Return Policy:** Approval is required prior to returning goods to Manufacturer. A restocking fee will apply.

6. **Entire Obligation:** This Limited Warranty states the entire obligation of Manufacturer with respect to the Products. If any part of this Limited Warranty is determined to be void or illegal, the remainder shall remain in full force and effect.

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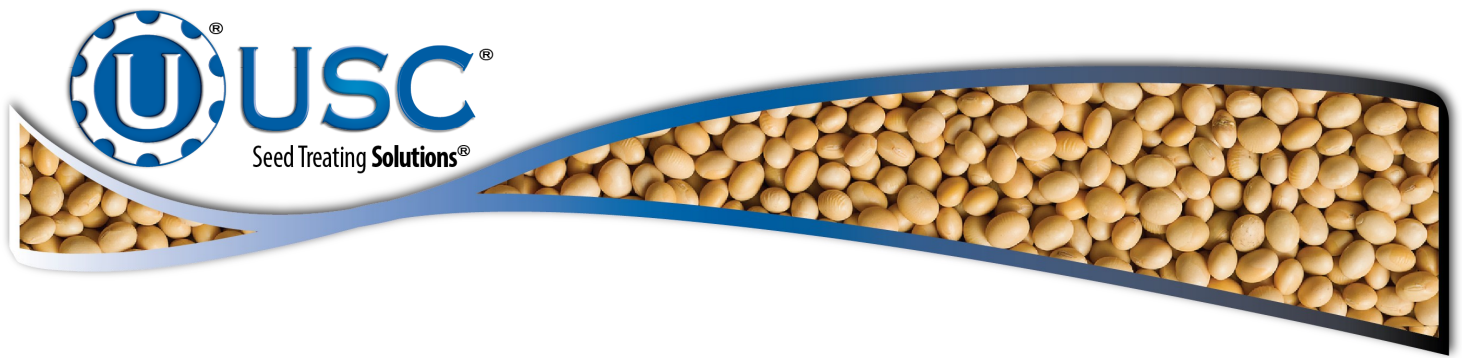
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